

REMARKS

Applicant respectfully requests reconsideration of this application as amended. Claims 1-6, 8, 9, and 24 are canceled. Claims 7, 10-23, and 25-29 are currently pending in this application.

Claim Rejections - 35 U.S.C. §103(a)

Claims 7, 10-23, and 25-29 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Reinhardt (U.S. Patent No. 6,747,243) in view of Allen (U.S. Patent Publication 2004/0182416).

Response to 35 U.S.C. §103(a) rejections

With regard to the rejection of claims 7, 10-23, and 25-29 under 35 U.S.C. §103(a) as being unpatentable over Reinhardt in view of Allen, applicant has amended the claims to overcome the examiner's rejection.

Specifically, applicant has amended the independent claims 7, 17 and 25 to add the limitation that the laser ablation process according to the present invention causes evaporation and fragmentation of the particle defect, generated from an explosive evaporation of the particle. Applicant submits that this limitation is disclosed in paragraph [0016], lines 8-11, thus there is no new material added.

Applicant submits that the broad meaning of "laser ablation", according to Wikipedia, the Online Dictionary, is that "*laser ablation is the process of removing material from a solid (or occasionally liquid) surface by irradiating it with a laser beam*". The conventional process of removing material by laser ablation includes a process where the material is heated by the absorbed laser energy and evaporates or sublimes.

The present invention follows the broad meaning of laser ablation, but defining the process of removing material to include the heating of the particle to cause evaporation and fragmentation, with the particle underwent explosive evaporation. This definition is disclosed in paragraph [0016] and illustrated in the sequence of Figs. 2B to 2D. The particle 206, upon being struck by a laser beam 208, vaporizingly explodes, leaving smaller particle fragments 212. Thus in the laser ablation process according to

the present invention, the particle partially vaporizes and partially breaks into smaller particle fragments.

Applicant submits that Reinhardt also follows the broad meaning of laser ablation, but defining the process of removing material with thermal shock (Col. 11, line 37; Col. 11, lines 47-48). Thermal shock is a process where the particle undergoes rapid temperature changes, generating expansion/contraction at the contacting surfaces, and thus reducing the adhesion of the particle to the substrate surface. Once the particle is struck loose from the substrate surface by Reinhardt's laser ablation process (e.g. with thermal shock), it may be carried away by a nitrogen flow (Reinhardt, Col. 11, lines 66-67).

Further, applicant submits that Reinhardt teaches away from the process of vaporizing the particles by disclosing that the laser tool removes the particles indiscriminant of materials or composition (Col. 11, line 45-46). Reinhardt taught that the reason is that the laser beam removes the particles by thermal shock. Applicant submits that another explanation for the laser beam to remove the particles indiscriminant of materials or composition is that there is no vaporization process involved, and that the laser beam, according to Reinhardt, only needs to provide enough energy to heat the particle to cause expansion/contraction (e.g. thermal shock) for reducing adhesion, and not enough to cause evaporation.

Further, applicant submits that Reinhardt fails to teach fragmenting the particle by laser ablation though explosive evaporation.

With regard to Allen, applicant submits that Allen discloses a process for pulling particles off the surface by explosive evaporation of a transfer medium rather than evaporating the particles themselves.

In sum, applicant submits that the present invention laser ablation process comprises the explosive evaporation of the particle, partially vaporizing and partially breaking the particle into smaller fragments. Applicant submits that the present invention laser ablation process is distinct from Reinhardt's laser ablation process, which employs thermal shock and not vaporization, and from Allen's explosive evaporation process, which vaporizes the transfer medium and not the particle. Further, applicant submits that with Reinhardt teaching away from using laser beam to vaporize the particle, Allen

failing to teach vaporizing the particle, and both Reinhardt and Allen failing to teach using laser beam for fragmenting the particle, the combination of Reinhardt and Allen would not render the present invention obvious.

With respect to the dependent claims, applicant submits that these dependent claims should be allowable, at least for the reason stated above with respect to the independent claims 7, 17 and 25.

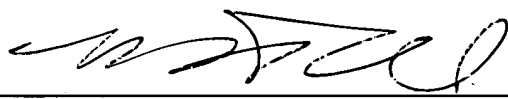
In conclusion, applicants respectfully submit that in view of the amendments and arguments set forth herein, the applicable rejections have been overcome.

Pursuant to 37 C.F.R. 1.136(a)(3), applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

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